Analysis of Selected Physical Fitness Variables Associated with Playing Performance of Male Volleyball Players

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ABSTRACT

The purpose of the study was to find out the relationship between selected physical fitness variables with playing performance of male Volleyball players.

The sample consisted of 96 Volleyball players, who were undergoing training at various training centres of Sports Authority of India. 20meter dash, sargent jump, semo agility, Basketball throw, sit and reach, bridge-up and 1500 meter run tests were administered to determine the motor fitness. Playing performance was evaluated using four point rating scale. All the measurements were taken using standard equipments and techniques. The data were analyzed using Pearson's Product Moment Coefficient Correlation.

The analysis showed that playing performance has significant relationship with speed, agility, jumping ability and hitting strength; whereas, no significant relationship was found with flexibility and endurance.

INTRODUCTION

In Volleyball, there is a sequence of six distinct phases or elements that are repeated over and over, creating a rhythmical flow. These six elements are serve, serve reception, set, attack, block and defense. This sequence can be disrupted and terminated at any time or it can go into a cycle alternating between one team's attack and another's defense.

Competitive Volleyball has high physiological demands. The players are repetitively jumping with full effort while spiking, serving and blocking and eventually also while setting and passing. They are in constant movement as long as the ball is in play. They make explosive actions while applying emergency techniques, in order to reach the ball. This requires strength, speed, agility, flexibility, reaction and specific endurance.

Volleyball is a game dominated by jumping actions on the net. The height of jumping reach is influenced by the body height and jumping ability of a player. In last few years, it has been experienced that, in international competitions, the participating teams are in commanding position not only due to extraordinary height of the players but also because of an impressive jumping power (Chaudhary, 1991).

METHODOLOGY

96 male Volleyball players, between 14 to 19 years of age, from various centers of Sports Authority of India were taken as subjects. Playing performance was recorded using 4-

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point rating scale during competition. 20 meter dash (speed), sargent jump (jumping ability), semo agility (agility), Basketball throw (hitting ability), sit and reach (flexibility), bridge up (flexibility)and 1500 meter run (endurance) tests were used to determine the physical fitness. Standard techniques and procedure were followed while collecting data. Mean, standard deviation and correlation were computed to interpret the data.

RESULT & DISCUSSION

Table- 1 : Mean and Standard deviation of playing performance and physical fitness tests.

	Playing performance (success %)	20 meter dash (sec.)	Semo agility (sec.)	Sargent jump (cm)	Basketball throw (meters)	Sit and reach (cm)	Bridge up (cm)	1500 meter run (sec)
Mean	55.960	3.567	12.535	60.694	24.404	13.803	70.135	346.44
SD	10.685	0.210	0.644	7.843	2.966	7.743	13.491	29.23

(The value 0.195 is significant at 0.05 level and the value 0.254 is significant at 0.01 level.)

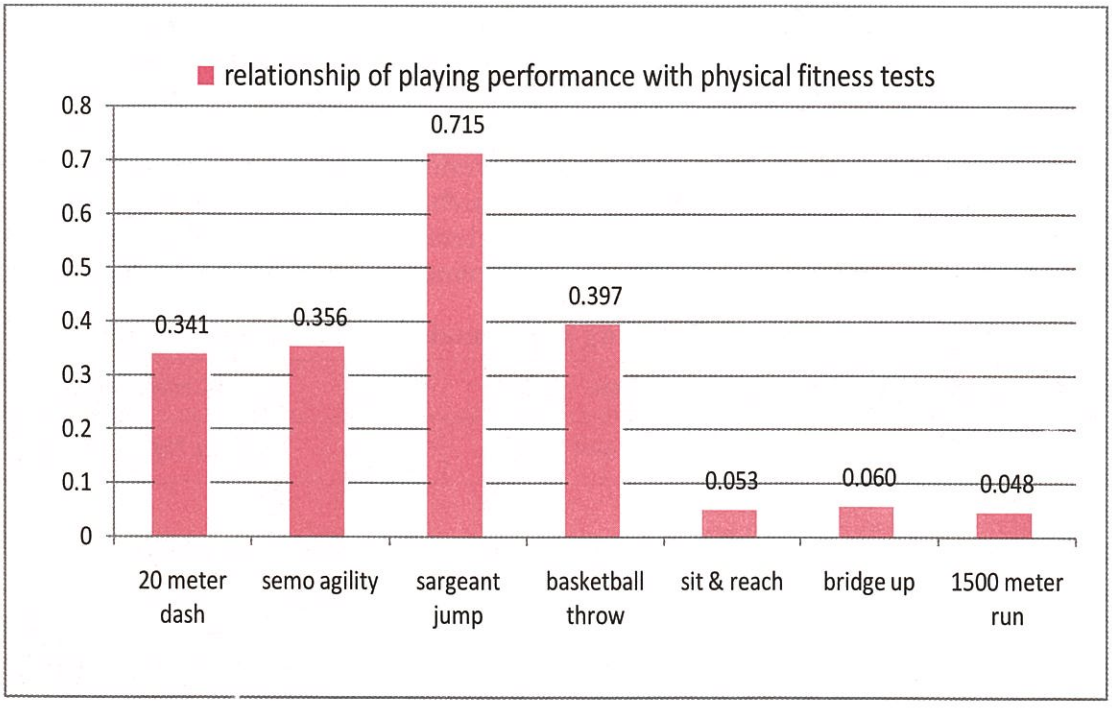

Fig-1: Showing the relationship of playing performance with physical fitness tests.

Table-2: Relationship of playing performance with 20 meter dash test.

	N	Mean	SD	Correlation
20 meter dash(sec.)	96	3.567	0.2103	**-0.341***

*Significant at 0.01level

The value -0.341, in Table 2, indicates that there is significant relationship of speed ability with playing performance. 20 meter dash test measure reaction ability, movement speed and acceleration ability, which are very much required to reach the ball during Volleyball play.

Clearena (1991) conducted a study on 28 women Volleyball players, to find the factors associated with success in Volleyball. She found that reaction time and jumping ability were significantly related to success in Volleyball.

Table-3: Relationship of playing performance with semo agility test.

	N	Mean	SD	Correlation
Semo agility (sec.)	96	12.535	0.644	**-0.356***

*Significant at 0.01level

The value -0.356 in Table 3 shows significant relationship of agility with playing performance. All the skills in Volleyball are open skills except serve, Sudden deflection of ball during play requires high level of agility.

Pekka (1988) stated that in ball games, player can move with or without ball with varying pattern of motion. These actions vary in duration, speed, space, directions and tactical goal.

Devi (1985) conducted a study on 36 college level Volleyball players, which revealed that agility and speed of movement significantly contribute to Volleyball playing ability. A significant correlation of agility and speed of movement might be expected in Volleyball, as it demands a quick acceleration rate along with performing movements in different directions.

Table -4: Relationship of playing performance with sargent jump test.

	N	Mean	SD	Correlation
Sargent jump(cm)	96	60.694	7.8431	**0.715***

*Significant at 0.01level

The value 0.715, in Table 4, indicates a strong significant relationship of jumping ability with playing performance. Serve, spike and block are the scoring skills, in the game of Volleyball, which require good jumping ability, to get success.

The height of action above net is another deciding factor for victory in modern top Volleyball. Therefore the teams to establish their superiority in spiking and blocking above the net is

continuously striving to improve upon the height of players, good jumping ability and perfect skills for spiking, blocking and serving. However, it is pertinent to consider that the body height must be combined with the jumping ability and par excellence in skills.

Gestavo (2013) found that vertical jump height is particularly relevant in Volleyball, and is directly linked to the athletic performance in various situations. Joseph (1983) also found that power was the most reliable variable in prediction of playing ability of men Volleyball players. According to Fleck (1985) the better players have been older, stronger, larger and able to jump higher. Sridhar (1984) conducted a study on 30 college Volleyball players, to determine the relationship between agility, flexibility, muscular endurance with playing ability in Volleyball. The study showed the significant relationship between power and performance.

Table-5: Relationship of playing performance with basketball throw test.

	N	Mean	SD	Correlation
Basketball throw (m)	96	24.404	2.9667	**0.397***

*Significant at 0.01level

Basketball throw test measures the explosiveness of shoulder and trunk. Hitting the ball hard to earn a point during spiking; jump serve is a precondition. The value 0.397 in Table 5 indicates that there is significant relationship between shoulder strength and playing performance in Volleyball.

Heimer et al (1988) stated that the characteristics of Volleyball are that a player jumps 140 to 200 times with maximum effort during an average match. Over 50% of striking also takes place during a jump. That is why the explosive power is one of the most important factors in Volleyball. It shows that arm and shoulder strength is one of the important prerequisite to be a high level Volleyball player.

Table-6: Relationship of playing performance with sit and reach and bridge up tests.

	N	Mean	SD	Correlation
Sit and reach(cm)	96	13.803	7.7438	0.053
Bridge up(cm)	96	70.135	13.4915	0.060

The values 0.053 and 0.060 in Table 6 show no significant relationship of trunk flexibility with playing performance in Volleyball. Though an optimum flexibility is required for the effective execution of skills, to score a point; but, over or under flexibility may affect the performance negatively.

Table-7: Relationship of playing performance with 1500 meter run test.

	N	Mean	SD	Correlation
1500 meter run(sec)	96	346.44	29.23	-0.048

The value -0.048 in Table 7 shows no significant relationship of endurance with playing performance. Volleyball is dominated by jumping actions with sufficient time in between. Average duration of a rally, in top level in men section, is 6 to 8 seconds, with an average recovery period of around 12 to 15 seconds. Endurance helps in faster recovery; but, it directly does not contribute in scoring a point in Volleyball.

CONCLUSION

Following conclusion was drawn, based on the finding and limitations of the study :

Speed, agility, jumping ability and hitting strength significantly contribute in playing performance in Volleyball; whereas, flexibility and running endurance showed non-significant relationship with playing performance.

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